

Honeywell Docket No. H0002800.34350 US- 4015
Buchalter Docket No.: H9945-3905

REMARKS

CLAIM REJECTIONS – 35 USC 112

The Examiner rejects claims 77-78 and 89 as being in definite for failing to particularly point out and distinctly claim the subject matter, which applicant regards as the invention. The Applicant respectfully disagrees, especially based on the fact that those claims are herein canceled.

CLAIM REJECTIONS – 35 USC 103

Claims 24-31 and 40-43 are rejected under 35 USC 103(a) as being unpatentable over Bae (KR 2001-511244) in view of Gilman (US 6086735) and Kulkarni (US 6283357). The Applicant respectfully disagrees.

Claim 24 recites:

"A physical vapor deposition target comprising:

a shape, the shape including at least one cup having a first end and a second end in opposing relation to the first end; the first end having an opening extending therein; the cup having a hollow therein; the hollow extending from the opening in the first end toward the second end; the cup having an interior surface defining a periphery of the hollow; the shape including an exterior surface extending around an exterior of the cup and in opposing relation to the interior surface; the exterior surface comprising a region which wraps around at least a portion of the second end with a rounded corner; the rounded corner having a radius of curvature of at least about 1 inch; and

a sputtering surface defined along the interior surface of the cup, wherein the target comprises a cast ingot."

Figures 13, 15 and 16 of the current application show contemplated embodiments of the deposition target of claim 24. Specifically, the target comprises a "cup" portion having an exterior surface and an interior surface. In Figure 16, the interior surface is represented as reference number 308. As recited in claim 24, the sputtering surface is defined along the interior surface of the cup. It should be noted in Figure 19, that the interior surfaces of the cups are those surfaces that are being sputtered.

The Bae reference is exactly the opposite of the target disclosed in the present application. In Bae, the sputtering surface is shown as reference number 10. This surface is analogous to the exterior surface of the target in the present application. Therefore, one of ordinary skill in the art of sputtering targets would not recognize after a fair reading of Bae that the opposite side of the Bae target can be utilized as a sputtering target. Note that Bae specifically states that "A sputtering target for a semiconductor is provided...to improve the yield of a wafer, **by rounding a corner of a portion necessary for sputtering.**" Bae shows in the Figure that the rounding corner is that corner on the sputtering surface of the target – but the sputtering surface of the target is not formed in the shape of a cup, as it is in the present application.

The Examiner contends that a cup with a rounded corner is universal, regardless of the surface being utilized for sputtering, and that one of ordinary skill of the art wouldn't distinguish the two surfaces and how the curvature of the surfaces affects deposition. That contention is just not true – based primarily on the fact that using the interior surface of the target for sputtering treats the flight path of atoms completely differently than those coming off an exterior curved surface. They aren't analogous at all. The Examiner needs to provide more evidence that one of ordinary skill in the art would consider them analogous aside from stating that "it is argued that looking at Bae one of ordinary skill in the art would see a cup with a rounded corner." While that may be true, it doesn't take away from the point that claim 24 states: "a sputtering surface defined along the interior surface of the cup."

The Gilman reference specifically teaches a "planar bottom surface typically bonded or otherwise joined to a conventional target backplate..." (see Column 2, lines 56-65). Therefore, the Gilman reference fails to motivate one of ordinary skill in the art to produce a sputtering target having a cup with a hollow therein. There is also no motivation to combine the teachings of Bae and Gilman, because neither reference indicates that the combination would be appropriate or needed. As a matter of fact, it appears that the Examiner is utilizing hindsight in order to combine these references.

"The genius of invention is often a combination of known elements which in hindsight seems preordained. To prevent hindsight invalidation of patent claims, the law requires some "teaching, suggestion or reason" to combine cited references... When the art in question is relatively simple, as is the case here, the opportunity to judge by hindsight is particularly tempting. Consequently, the tests of whether to combine references need to be applied rigorously." (McGinley v. Franklin Sports Inc., 262 F.3d 1339, 60 USPQ2d 1001, 1008 (Fed. Cir. 2001)(citing Gambro Lundia AB v. Baxter Healthcare Corp., 110 F.3d 1573, 1579, 42 USPQ2d 1378, 1383 (Fed. Cir. 1997)).

Failure of the Examiner to provide the necessary suggestion or motivation will create a presumption that the combination of references selected by the Examiner to support the obviousness rejection was based on hindsight. (Irah H. Donner, *Patent Prosecution, Practice & Procedure Before the U.S. Patent Office*, Third Edition) In this case, the Examiner fails to point out how one of ordinary skill in the art would read either Bae or Gilman and determine that they needed to be improved by incorporating the disclosure from the other reference.

The Kulkarni reference discloses a clad hollow cathode magnetron sputter target that is made from a plate of sputter target material and a sheet of cladding material. Kulkarni specifically explains that the benefit of the Kulkarni disclosure is that it solves the problems inherent with monolithic targets, including cost and weight (see Abstract, among other sections). The present application, along with the independent claims, covers targets that are produced from ingots and cast ingots that are ultimately formed into monolithic targets, which is exactly the opposite of Kulkarni. Therefore, it stands to reason that one would not read Kulkarni and consider this application, alone or in combination with Bae or Gilman, to produce the claims of the current application.

The Federal Circuit has stated that "[o]bviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching, suggestion or incentive supporting the combination." (See *In re Geiger*, 815 F.2d 686, 2 USPQ2d 1276, 1278 (Fed. Cir. 1987). The Patent Office applies the same standard. "When the incentive to combine the teachings of the references is not readily apparent, it is the duty of the examiner to explain why combination of the reference teachings is proper...Absent such reasons or incentives, the teachings of the references are not combinable." (See *Ex parte Skinner*, 2 USPQ2d 1788, 1790 (BPAI 1986). The Federal Circuit crystallizes this concept by the following ruling:

"It is impermissible to use the claimed invention as an instruction manual or "template" to piece together the teachings of the prior art so that the claimed invention is rendered obvious. This court has previously stated that "[o]ne cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention." (See *In re Fritch*, 972 F.2d 1260, 23 USPQ2d 1780, 1784 (Fed. Cir. 1992) (quoting *In re Fine*, 837 F.2d 1071, 1075, 5 USPQ2d 1596, 1600 (Fed. Cir. 1988)).

Close adherence to this standard is especially important in the case of less technologically complex inventions, where the very ease with which the invention can be understood may prompt one "to fall victim to the insidious effect of a hindsight syndrome wherein that which only the inventor taught is used against the teacher." (See *In re Dembiczak*, 175 F.3d 994, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999)(citing *W. L. Gore & Assocs. v. Garlock, inc.*, 721 F.2d 1540, 1553, 220 USPQ 303, 313 (Fed. Cir. 1983), cert. denied, 469 U.S. 851 (1984). In addition, a general relationship between fields of the prior art patents to be combined is insufficient to establish the suggestion or motivation. (See *Interactive Techs., Inc. v. Pittway Corp.*, Civ. App. No.: 98-1464, slip op. at 13 (Fed. Cir. June 1, 1999)(unpublished), cert. denied, 528 U.S. 1046 (1999). As stated by the Federal Circuit:

Claims 32-37, 39 and 44-49 are rejected under 35 USC 103(a) as being unpatentable over Bae (KR 2001-511244) in view of Gilman (US 6086735) and Kulkarni (US 6283357), as applied to claims 24-31 and 40-43 above, and further in view of Kardokus et al (US 6113761). The Applicant respectfully disagrees.

Claim 24 recites:

"A physical vapor deposition target comprising:

a shape, the shape including at least one cup having a first end and a second end in opposing relation to the first end; the first end having an opening extending therein; the cup having a hollow therein; the hollow extending from the opening in the first end toward the second end; the cup having an interior surface defining a periphery of the hollow; the shape including an exterior surface extending around an exterior of the cup and in opposing relation to the interior surface; the exterior surface comprising a region which wraps around at least a portion of the second end with a rounded corner; the rounded corner having a radius of curvature of at least about 1 inch; and

a sputtering surface defined along the interior surface of the cup, wherein the target comprises a cast ingot."

Figures 13, 15 and 16 of the current application show contemplated embodiments of the deposition target of claim 24. Specifically, the target comprises a "cup" portion having an exterior surface and an interior surface. In Figure 16, the interior surface is represented as reference number 308. As recited in claim 24, the sputtering surface is defined along the interior surface of the cup. It should be noted in Figure 19, that the interior surfaces of the cups are those surfaces that are being sputtered.

The Bae reference is exactly the opposite of the target disclosed in the present application. In Bae, the sputtering surface is shown as reference number 10. This surface

is analogous to the exterior surface of the target in the present application. Therefore, one of ordinary skill in the art of sputtering targets would not recognize after a fair reading of Bae that the opposite side of the Bae target can be utilized as a sputtering target. Note that Bae specifically states that "A sputtering target for a semiconductor is provided...to improve the yield of a wafer, **by rounding a corner of a portion necessary for sputtering.**" Bae shows in the Figure that the rounding corner is that corner on the sputtering surface of the target – but the sputtering surface of the target is not formed in the shape of a cup, as it is in the present application.

The Examiner contends that a cup with a rounded corner is universal, regardless of the surface being utilized for sputtering, and that one of ordinary skill of the art wouldn't distinguish the two surfaces and how the curvature of the surfaces affects deposition. That contention is just not true – based primarily on the fact that using the interior surface of the target for sputtering treats the flight path of atoms completely differently than those coming off an exterior curved surface. They aren't analogous at all. The Examiner needs to provide more evidence that one of ordinary skill in the art would consider them analogous aside from stating that "it is argued that looking at Bae one of ordinary skill in the art would see a cup with a rounded corner." While that may be true, it doesn't take away from the point that claim 24 states: "a sputtering surface defined along the interior surface of the cup."

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Close adherence to this standard is especially important in the case of less technologically complex inventions, where the very ease with which the invention can be understood may prompt one "to fall victim to the insidious effect of a hindsight syndrome wherein that which only the inventor taught is used against the teacher." (See *In re Dembiczak*, 175 F.3d 994, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999)(citing *W. L. Gore & Assocs. v. Garlock, inc.*, 721 F.2d 1540, 1553, 220 USPQ 303, 313 (Fed. Cir. 1983), cert. denied, 469 U.S. 851 (1984). In addition, a general relationship between fields of the prior art patents to be combined is insufficient to establish the suggestion or motivation. (See *Interactive Techs., Inc. v. Pittway Corp.*, Civ. App. No.: 98-1464, slip op. at 13 (Fed. Cir. June 1, 1999)(unpublished), cert. denied, 528 U.S. 1046 (1999). As stated by the Federal Circuit:

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claims, the law requires some "teaching, suggestion or reason" to combine cited references... When the art in question is relatively simple, as is the case here, the opportunity to judge by hindsight is particularly tempting. Consequently, the tests of whether to combine references need to be applied rigorously." (McGinley v. Franklin Sports Inc., 262 F.3d 1339, 60 USPQ2d 1001, 1008 (Fed. Cir. 2001)(citing Gambro Lundia AB v. Baxter Healthcare Corp., 110 F.3d 1573, 1579, 42 USPQ2d 1378, 1383 (Fed. Cir. 1997)).

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The Kulkarni reference discloses a clad hollow cathode magnetron sputter target that is made from a plate of sputter target material and a sheet of cladding material. Kulkarni specifically explains that the benefit of the Kulkarni disclosure is that it solves the problems inherent with monolithic targets, including cost and weight (see Abstract, among other sections). The present application, along with the independent claims, covers targets that are produced from ingots and cast ingots that are ultimately formed into monolithic targets, which is exactly the opposite of Kulkarni. Therefore, it stands to reason that one would not read Kulkarni and consider this application, alone or in combination with Bae or Gilman, to produce the claims of the current application.

Kardokus does not cure the obvious deficiencies of Bae, Gilman or Kulkarni, alone or in combination with one another. Therefore, claim 24 is considered allowable, along with the related dependent claims, in view of Bae, Gilman, Kulkarni and/or Kardokus.

Claims 32-36 and 38 are rejected under 35 USC 103(a) as being unpatentable over Bae (KR 2001-511244) in view of Gilman (US 6086735) and Kulkarni (US 6283357), as applied to claims 24-31 and 40-43 above, and further in view of Pavate et al (US 6391163). The Applicant respectfully disagrees.

Claim 24 recites:

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a sputtering surface defined along the interior surface of the cup."

Figures 13, 15 and 16 of the current application show contemplated embodiments of the deposition target of claim 24. Specifically, the target comprises a "cup" portion having an exterior surface and an interior surface. In Figure 16, the interior surface is represented as reference number 308. As recited in claim 24, the sputtering surface is defined along the interior surface of the cup. It should be noted in Figure 19, that the interior surfaces of the cups are those surfaces that are being sputtered.

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Close adherence to this standard is especially important in the case of less technologically complex inventions, where the very ease with which the invention can be understood may prompt one "to fall victim to the insidious effect of a hindsight syndrome wherein that which only the inventor taught is used against the teacher." (See *In re Dembiczak*, 175 F.3d 994, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999)(citing *W. L. Gore & Assocs. v. Garlock, inc.*, 721 F.2d 1540, 1553, 220 USPQ 303, 313 (Fed. Cir. 1983), cert. denied, 469 U.S. 851 (1984). In addition, a general relationship between fields of the prior art patents to be combined is insufficient to establish the suggestion or motivation. (See *Interactive Techs., Inc. v. Pittway Corp.*, Civ. App. No.: 98-1464, slip op. at 13 (Fed. Cir. June 1, 1999)(unpublished), cert. denied, 528 U.S. 1046 (1999). As stated by the Federal Circuit:

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Pavate does not cure the obvious deficiencies of Bae, Gilman or Kulkarni, alone or in combination with one another. Therefore, claim 24 is considered allowable, along with the related dependent claims, in view of Bae, Gilman, Kulkarni and/or Pavate.

Claims 50-57 and 61-63 are rejected under 35 USC 103(a) as being unpatentable over Bae (KR 2001-511244) in view of Gilman (US 6086735) and Kulkarni (US 6283357), as applied to claims 24-31 and 40-43 above, and further in view of Lai et al (US 6179973). The Applicant respectfully disagrees.

Claim 24 recites:

"A physical vapor deposition target comprising:

a shape, the shape including at least one cup having a first end and a second end in opposing relation to the first end; the first end having an opening extending therein; the cup having a hollow therein; the hollow extending from the opening in the first end toward the second end; the cup having an interior surface defining a periphery of the hollow; the shape including an exterior surface extending around an exterior of the cup and in opposing relation to the interior surface; the exterior surface comprising a region which wraps around at least a portion of the second end with a rounded corner; the rounded corner having a radius of curvature of at least about 1 inch; and

a sputtering surface defined along the interior surface of the cup."

Figures 13, 15 and 16 of the current application show contemplated embodiments of the deposition target of claim 24. Specifically, the target comprises a "cup" portion having an exterior surface and an interior surface. In Figure 16, the interior surface is represented as reference number 308. As recited in claim 24, the sputtering surface is defined along the interior surface of the cup. It should be noted in Figure 19, that the interior surfaces of the cups are those surfaces that are being sputtered.

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Lai does not cure the obvious deficiencies of Bae, Gilman or Kulkarni, alone or in combination with one another. Therefore, claim 24 is considered allowable, along with the related dependent claims, in view of Bae, Gilman, Kulkarni and/or Lai.

Claims 58, 60 and 64-66 are rejected under 35 USC 103(a) as being unpatentable over Bae (KR 2001-511244) in view of Gilman (US 6086735) and Kulkarni (US 6283357) and further in view of Lai et al. as applied to claims 24-31, 40-43, 50-57 and 61-63 above, and further in view of Kardokus et al (US 611761). The Applicant respectfully disagrees.

Claim 24 recites:

"A physical vapor deposition target comprising:

a shape, the shape including at least one cup having a first end and a second end in opposing relation to the first end; the first end having an opening extending therein; the cup having a hollow therein; the hollow extending from the opening in the first end toward the second end; the cup having an interior surface defining a periphery of the hollow; the shape including an exterior surface extending around an exterior of the cup and in opposing relation to the interior surface; the exterior surface comprising a region which wraps around at least a portion of the second end with a rounded corner; the rounded corner having a radius of curvature of at least about 1 inch; and

a sputtering surface defined along the interior surface of the cup."

Figures 13, 15 and 16 of the current application show contemplated embodiments of the deposition target of claim 24. Specifically, the target comprises a "cup" portion having an exterior surface and an interior surface. In Figure 16, the interior surface is represented as reference number 308. As recited in claim 24, the sputtering surface is defined along the interior surface of the cup. It should be noted in Figure 19, that the interior surfaces of the cups are those surfaces that are being sputtered.

The Bae reference is exactly the opposite of the target disclosed in the present application. In Bae, the sputtering surface is shown as reference number 10. This surface is analogous to the exterior surface of the target in the present application. Therefore, one

of ordinary skill in the art of sputtering targets would not recognize after a fair reading of Bae that the opposite side of the Bae target can be utilized as a sputtering target. Note that Bae specifically states that "A sputtering target for a semiconductor is provided...to improve the yield of a wafer, **by rounding a corner of a portion necessary for sputtering.**" Bae shows in the Figure that the rounding corner is that corner on the sputtering surface of the target – but the sputtering surface of the target is not formed in the shape of a cup, as it is in the present application.

The Examiner contends that a cup with a rounded corner is universal, regardless of the surface being utilized for sputtering, and that one of ordinary skill of the art wouldn't distinguish the two surfaces and how the curvature of the surfaces affects deposition. That contention is just not true – based primarily on the fact that using the interior surface of the target for sputtering treats the flight path of atoms completely differently than those coming off an exterior curved surface. They aren't analogous at all. The Examiner needs to provide more evidence that one of ordinary skill in the art would consider them analogous aside from stating that "it is argued that looking at Bae one of ordinary skill in the art would see a cup with a rounded corner." While that may be true, it doesn't take away from the point that claim 24 states: "a sputtering surface defined along the interior surface of the cup."

The Gilman reference specifically teaches a "planar bottom surface typically bonded or otherwise joined to a conventional target backplate...". (see Column 2, lines 56-65). Therefore, the Gilman reference fails to motivate one of ordinary skill in the art to produce a sputtering target having a cup with a hollow therein. There is also no motivation to combine the teachings of Bae and Gilman, because neither reference indicates that the combination would be appropriate or needed. As a matter of fact, it appears that the Examiner is utilizing hindsight in order to combine these references.

The Federal Circuit has stated that "[o]bviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching, suggestion or incentive supporting the combination." (See *In re Geiger*, 815 F.2d 686, 2 USPQ2d 1276, 1278 (Fed. Cir. 1987)). The Patent Office applies the same

standard. "When the incentive to combine the teachings of the references is not readily apparent, it is the duty of the examiner to explain why combination of the reference teachings is proper...Absent such reasons or incentives, the teachings of the references are not combinable." (See *Ex parte Skinner*, 2 USPQ2d 1788, 1790 (BPAI 1986). The Federal Circuit crystallizes this concept by the following ruling:

"It is impermissible to use the claimed invention as an instruction manual or "template" to piece together the teachings of the prior art so that the claimed invention is rendered obvious. This court has previously stated that "[o]ne cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention." (See *In re Fritch*, 972 F.2d 1260, 23 USPQ2d 1780, 1784 (Fed. Cir. 1992) (quoting *In re Fine*, 837 F.2d 1071, 1075, 5 USPQ2d 1596, 1600 (Fed. Cir. 1988)).

Close adherence to this standard is especially important in the case of less technologically complex inventions, where the very ease with which the invention can be understood may prompt one "to fall victim to the insidious effect of a hindsight syndrome wherein that which only the inventor taught is used against the teacher." (See *In re Dembiczak*, 175 F.3d 994, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999)(citing *W. L. Gore & Assocs. v. Garlock, inc.*, 721 F.2d 1540, 1553, 220 USPQ 303, 313 (Fed. Cir. 1983), cert. denied, 469 U.S. 851 (1984). In addition, a general relationship between fields of the prior art patents to be combined is insufficient to establish the suggestion or motivation. (See *Interactive Techs., Inc. v. Pittway Corp.*, Civ. App. No.: 98-1464, slip op. at 13 (Fed. Cir. June 1, 1999)(unpublished), cert. denied, 528 U.S. 1046 (1999). As stated by the Federal Circuit:

"The genius of invention is often a combination of known elements which in hindsight seems preordained. To prevent hindsight invalidation of patent claims, the law requires some "teaching, suggestion or reason" to combine

cited references... When the art in question is relatively simple, as is the case here, the opportunity to judge by hindsight is particularly tempting. Consequently, the tests of whether to combine references need to be applied rigorously." (McGinley v. Franklin Sports Inc., 262 F.3d 1339, 60 USPQ2d 1001, 1008 (Fed. Cir. 2001)(citing Gambro Lundia AB v. Baxter Healthcare Corp., 110 F.3d 1573, 1579, 42 USPQ2d 1378, 1383 (Fed. Cir. 1997)).

Failure of the Examiner to provide the necessary suggestion or motivation will create a presumption that the combination of references selected by the Examiner to support the obviousness rejection was based on hindsight. (Irah H. Donner, *Patent Prosecution, Practice & Procedure Before the U.S. Patent Office*, Third Edition) In this case, the Examiner fails to point out how one of ordinary skill in the art would read either Bae or Gilman and determine that they needed to be improved by incorporating the disclosure from the other reference.

The Kulkarni reference discloses a clad hollow cathode magnetron sputter target that is made from a plate of sputter target material and a sheet of cladding material. Kulkarni specifically explains that the benefit of the Kulkarni disclosure is that it solves the problems inherent with monolithic targets, including cost and weight (see Abstract, among other sections). The present application, along with the independent claims, covers targets that are produced from ingots and cast ingots that are ultimately formed into monolithic targets, which is exactly the opposite of Kulkarni. Therefore, it stands to reason that one would not read Kulkarni and consider this application, alone or in combination with Bae or Gilman, to produce the claims of the current application.

Neither Lai nor Kardokus cure the obvious deficiencies of Bae, Gilman or Kulkarni, alone or in combination with one another. Therefore, claim 24 is considered allowable, along with the related dependent claims, in view of Bae, Gilman, Kulkarni, Kardokus and/or Lai.

Claim 59 is rejected under 35 USC 103(a) as being unpatentable over Bae (KR 2001-511244) in view of Gilman (US 6086735) and Kulkarni (US 6283357), as applied to claims 24-31, 40-43, 50-57 and 61-63 above, and further in view of Pavate et al (US 611761). The Applicant respectfully disagrees.

Claim 24 recites:

“A physical vapor deposition target comprising:

a shape, the shape including at least one cup having a first end and a second end in opposing relation to the first end; the first end having an opening extending therein; the cup having a hollow therein; the hollow extending from the opening in the first end toward the second end; the cup having an interior surface defining a periphery of the hollow; the shape including an exterior surface extending around an exterior of the cup and in opposing relation to the interior surface; the exterior surface comprising a region which wraps around at least a portion of the second end with a rounded corner; the rounded corner having a radius of curvature of at least about 1 inch; and

a sputtering surface defined along the interior surface of the cup.”

Figures 13, 15 and 16 of the current application show contemplated embodiments of the deposition target of claim 24. Specifically, the target comprises a “cup” portion having an exterior surface and an interior surface. In Figure 16, the interior surface is represented as reference number 308. As recited in claim 24, the sputtering surface is defined along the interior surface of the cup. It should be noted in Figure 19, that the interior surfaces of the cups are those surfaces that are being sputtered.

The Bae reference is exactly the opposite of the target disclosed in the present application. In Bae, the sputtering surface is shown as reference number 10. This surface is analogous to the exterior surface of the target in the present application. Therefore, one

of ordinary skill in the art of sputtering targets would not recognize after a fair reading of Bae that the opposite side of the Bae target can be utilized as a sputtering target. Note that Bae specifically states that "A sputtering target for a semiconductor is provided...to improve the yield of a wafer, **by rounding a corner of a portion necessary for sputtering.**" Bae shows in the Figure that the rounding corner is that corner on the sputtering surface of the target – but the sputtering surface of the target is not formed in the shape of a cup, as it is in the present application.

The Examiner contends that a cup with a rounded corner is universal, regardless of the surface being utilized for sputtering, and that one of ordinary skill of the art wouldn't distinguish the two surfaces and how the curvature of the surfaces affects deposition. That contention is just not true – based primarily on the fact that using the interior surface of the target for sputtering treats the flight path of atoms completely differently than those coming off an exterior curved surface. They aren't analogous at all. The Examiner needs to provide more evidence that one of ordinary skill in the art would consider them analogous aside from stating that "it is argued that looking at Bae one of ordinary skill in the art would see a cup with a rounded corner." While that may be true, it doesn't take away from the point that claim 24 states: "a sputtering surface defined along the interior surface of the cup."

The Gilman reference specifically teaches a "planar bottom surface typically bonded or otherwise joined to a conventional target backplate...". (see Column 2, lines 56-65). Therefore, the Gilman reference fails to motivate one of ordinary skill in the art to produce a sputtering target having a cup with a hollow therein. There is also no motivation to combine the teachings of Bae and Gilman, because neither reference indicates that the combination would be appropriate or needed. As a matter of fact, it appears that the Examiner is utilizing hindsight in order to combine these references.

The Federal Circuit has stated that "[o]bviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching, suggestion or incentive supporting the combination." (See *In re Geiger*, 815 F.2d 686, 2 USPQ2d 1276, 1278 (Fed. Cir. 1987)). The Patent Office applies the same

standard. "When the incentive to combine the teachings of the references is not readily apparent, it is the duty of the examiner to explain why combination of the reference teachings is proper...Absent such reasons or incentives, the teachings of the references are not combinable." (See *Ex parte Skinner*, 2 USPQ2d 1788, 1790 (BPAI 1986). The Federal Circuit crystallizes this concept by the following ruling:

"It is impermissible to use the claimed invention as an instruction manual or "template" to piece together the teachings of the prior art so that the claimed invention is rendered obvious. This court has previously stated that "[o]ne cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention." (See *In re Fritch*, 972 F.2d 1260, 23 USPQ2d 1780, 1784 (Fed. Cir. 1992) (quoting *In re Fine*, 837 F.2d 1071, 1075, 5 USPQ2d 1596, 1600 (Fed. Cir. 1988)).

Close adherence to this standard is especially important in the case of less technologically complex inventions, where the very ease with which the invention can be understood may prompt one "to fall victim to the insidious effect of a hindsight syndrome wherein that which only the inventor taught is used against the teacher." (See *In re Dembiczak*, 175 F.3d 994, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999)(citing *W. L. Gore & Assocs. v. Garlock, inc.*, 721 F.2d 1540, 1553, 220 USPQ 303, 313 (Fed. Cir. 1983), cert. denied, 469 U.S. 851 (1984). In addition, a general relationship between fields of the prior art patents to be combined is insufficient to establish the suggestion or motivation. (See *Interactive Techs., Inc. v. Pittway Corp.*, Civ. App. No.: 98-1464, slip op. at 13 (Fed. Cir. June 1, 1999)(unpublished), cert. denied, 528 U.S. 1046 (1999). As stated by the Federal Circuit:

"The genius of invention is often a combination of known elements which in hindsight seems preordained. To prevent hindsight invalidation of patent claims, the law requires some "teaching, suggestion or reason" to combine

cited references... When the art in question is relatively simple, as is the case here, the opportunity to judge by hindsight is particularly tempting. Consequently, the tests of whether to combine references need to be applied rigorously." (McGinley v. Franklin Sports Inc., 262 F.3d 1339, 60 USPQ2d 1001, 1008 (Fed. Cir. 2001)(citing Gambro Lundia AB v. Baxter Healthcare Corp., 110 F.3d 1573, 1579, 42 USPQ2d 1378, 1383 (Fed. Cir. 1997)).

Failure of the Examiner to provide the necessary suggestion or motivation will create a presumption that the combination of references selected by the Examiner to support the obviousness rejection was based on hindsight. (Irah H. Donner, *Patent Prosecution, Practice & Procedure Before the U.S. Patent Office*, Third Edition) In this case, the Examiner fails to point out how one of ordinary skill in the art would read either Bae or Gilman and determine that they needed to be improved by incorporating the disclosure from the other reference.

The Kulkarni reference discloses a clad hollow cathode magnetron sputter target that is made from a plate of sputter target material and a sheet of cladding material. Kulkarni specifically explains that the benefit of the Kulkarni disclosure is that it solves the problems inherent with monolithic targets, including cost and weight (see Abstract, among other sections). The present application, including the independent claims, covers targets that are produced from ingots and cast ingots that are ultimately formed into monolithic targets, which is exactly the opposite of Kulkarni. Therefore, it stands to reason that one would not read Kulkarni and consider this application, alone or in combination with Bae or Gilman, to produce the claims of the current application.

Pavate does not cure the obvious deficiencies of Bae, Gilman or Kulkarni, alone or in combination with one another. Therefore, claim 24 is considered allowable, along with the related dependent claims, in view of Bae, Gilman, Kulkarni and/or Pavate.

Claims 67-68, 70 and 72-76 are rejected under 35 USC 103(a) as being unpatentable over Kulkarni (US 6283357) in view of Kardokus et al (US 611761). The Applicant respectfully disagrees.

Claim 67 recites:

"A three-dimensional physical vapor deposition target, comprising:
a material comprising one or more of Cu, Ni, Co, Ta, Al, and Ti;
an average grain size of less than or equal to 250 microns within the material;
a shape, the shape including at least one cup having a first end and a second end in opposing relation to the first end; the first end having an opening extending therein; the cup having a hollow therein; the hollow extending from the opening in the first end toward the second end; the cup having an interior surface defining a periphery of the hollow; and
a sputtering surface defined along the interior surface of the cup."

Figures 13, 15 and 16 of the current application show contemplated embodiments of the deposition target of claim 67. Specifically, the target comprises a "cup" portion having an exterior surface and an interior surface. In Figure 16, the interior surface is represented as reference number 308. As recited in claim 67, the sputtering surface is defined along the interior surface of the cup. It should be noted in Figure 19, that the interior surfaces of the cups are those surfaces that are being sputtered.

The Kulkarni reference discloses a clad hollow cathode magnetron sputter target that is made from a plate of sputter target material and a sheet of cladding material. Kulkarni specifically explains that the benefit of the Kulkarni disclosure is that it solves the problems inherent with monolithic targets, including cost and weight (see Abstract, among other sections). The present application, including the independent claims, covers targets

that are produced from ingots and cast ingots that are ultimately formed into monolithic targets, which is exactly the opposite of Kulkarni. Therefore, it stands to reason that one would not read Kulkarni and consider this application, alone or in combination with Kardokus, to produce the claims of the current application.

Kardokus does not cure the obvious deficiencies of Kulkarni, alone or in combination with one another. Therefore, claim 67 is considered allowable, along with the related dependent claims, in view of Kulkarni and/or Kardokus.

Claims 78-80, 82, 84 and 85-88 are rejected under 35 USC 103(a) as being unpatentable over Kulkarni (US 6283357) in view of Kardokus et al (US 611761) as applied to claims 67-68, 70 and 72-76 above, and further in view of Lai et al. The Applicant respectfully disagrees.

Claim 67 recites:

"A three-dimensional physical vapor deposition target, comprising:
a material comprising one or more of Cu, Ni, Co, Ta, Al, and Ti;
an average grain size of less than or equal to 250 microns within the material;
a shape, the shape including at least one cup having a first end and a second end in opposing relation to the first end; the first end having an opening extending therein; the cup having a hollow therein; the hollow extending from the opening in the first end toward the second end; the cup having an interior surface defining a periphery of the hollow; and
a sputtering surface defined along the interior surface of the cup."

Figures 13, 15 and 16 of the current application show contemplated embodiments of the deposition target of claim 67. Specifically, the target comprises a "cup" portion having an exterior surface and an interior surface. In Figure 16, the interior surface is represented as reference number 308. As recited in claim 67, the sputtering surface is defined along the interior surface of the cup. It should be noted in Figure 19, that the interior surfaces of the cups are those surfaces that are being sputtered.

The Kulkarni reference discloses a clad hollow cathode magnetron sputter target that is made from a plate of sputter target material and a sheet of cladding material. Kulkarni specifically explains that the benefit of the Kulkarni disclosure is that it solves the problems inherent with monolithic targets, including cost and weight (see Abstract, among

other sections). The present application, including the independent claims, covers targets that are produced from ingots and cast ingots that are ultimately formed into monolithic targets, which is exactly the opposite of Kulkarni. Therefore, it stands to reason that one would not read Kulkarni and consider this application, alone or in combination with Kardokus or Lai, to produce the claims of the current application.

Neither Kardokus nor Lai cure the obvious deficiencies of Kulkarni, alone or in combination with one another. Therefore, claim 67 is considered allowable, along with the related dependent claims, in view of Kulkarni, Lai and/or Kardokus.

Claims 67, 69 and 73-76 are rejected under 35 USC 103(a) as being unpatentable over Kulkarni (US 6283357) in view of Michaluk et al (WO 00/31310). The Applicant respectfully disagrees.

Claim 67 recites:

"A three-dimensional physical vapor deposition target, comprising:
a material comprising one or more of Cu, Ni, Co, Ta, Al, and Ti;
an average grain size of less than or equal to 250 microns within the material;
a shape, the shape including at least one cup having a first end and a second end in opposing relation to the first end; the first end having an opening extending therein; the cup having a hollow therein; the hollow extending from the opening in the first end toward the second end; the cup having an interior surface defining a periphery of the hollow; and
a sputtering surface defined along the interior surface of the cup."

Figures 13, 15 and 16 of the current application show contemplated embodiments of the deposition target of claim 24. Specifically, the target comprises a "cup" portion having an exterior surface and an interior surface. In Figure 16, the interior surface is represented as reference number 308. As recited in claim 24, the sputtering surface is defined along the interior surface of the cup. It should be noted in Figure 19, that the interior surfaces of the cups are those surfaces that are being sputtered.

The Kulkarni reference discloses a clad hollow cathode magnetron sputter target that is made from a plate of sputter target material and a sheet of cladding material. Kulkarni specifically explains that the benefit of the Kulkarni disclosure is that it solves the problems inherent with monolithic targets, including cost and weight (see Abstract, among other sections). The present application, along with the independent claims, covers targets

that are produced from ingots and cast ingots that are ultimately formed into monolithic targets, which is exactly the opposite of Kulkarni. Therefore, it stands to reason that one would not read Kulkarni and consider this application, alone or in combination with Michaluk, to produce the claims of the current application.

Michaluk does not cure the obvious deficiencies of Kulkarni, alone or in combination with one another. Therefore, claim 67 is considered allowable, along with the related dependent claims, in view of Kulkarni and/or Michaluk.

Claims 78-79, 81 and 85-88 are rejected under 35 USC 103(a) as being unpatentable over Kulkarni (US 6283357) in view of Michaluk et al (WO 00/31310) as applied to claims 67, 69 and 73-76 above and further in view of Lai et al (US 6179973). The Applicant respectfully disagrees.

Claim 67 recites:

"A three-dimensional physical vapor deposition target, comprising:
a material comprising one or more of Cu, Ni, Co, Ta, Al, and Ti;
an average grain size of less than or equal to 250 microns within the material;
a shape, the shape including at least one cup having a first end and a second end in opposing relation to the first end; the first end having an opening extending therein; the cup having a hollow therein; the hollow extending from the opening in the first end toward the second end; the cup having an interior surface defining a periphery of the hollow; and
a sputtering surface defined along the interior surface of the cup."

Figures 13, 15 and 16 of the current application show contemplated embodiments of the deposition target of claim 24. Specifically, the target comprises a "cup" portion having an exterior surface and an interior surface. In Figure 16, the interior surface is represented as reference number 308. As recited in claim 24, the sputtering surface is defined along the interior surface of the cup. It should be noted in Figure 19, that the interior surfaces of the cups are those surfaces that are being sputtered.

The Kulkarni reference discloses a clad hollow cathode magnetron sputter target that is made from a plate of sputter target material and a sheet of cladding material. Kulkarni specifically explains that the benefit of the Kulkarni disclosure is that it solves the problems inherent with monolithic targets, including cost and weight (see Abstract, among

other sections). The present application, including the independent claims, covers targets that are produced from ingots and cast ingots that are ultimately formed into monolithic targets, which is exactly the opposite of Kulkarni. Therefore, it stands to reason that one would not read Kulkarni and consider this application, alone or in combination with Michaluk and Lai, to produce the claims of the current application.

Michaluk and/or Lai does not cure the obvious deficiencies of Kulkarni, alone or in combination with one another. Therefore, claim 67 is considered allowable, along with the related dependent claims, in view of Kulkarni, Lai and/or Michaluk.

Claim 71 is rejected under 35 USC 103(a) as being unpatentable over Kulkarni (US 6283357) in view of Kardokus as applied to claims 67, 68, 70 and 72-76 above and further in view of Pavate. The Applicant respectfully disagrees.

Claim 67 recites:

"A three-dimensional physical vapor deposition target, comprising:

a material comprising one or more of Cu, Ni, Co, Ta, Al, and Ti;

an average grain size of less than or equal to 250 microns within the material;

a shape, the shape including at least one cup having a first end and a second end in opposing relation to the first end; the first end having an opening extending therein; the cup having a hollow therein; the hollow extending from the opening in the first end toward the second end; the cup having an interior surface defining a periphery of the hollow; and

a sputtering surface defined along the interior surface of the cup."

Figures 13, 15 and 16 of the current application show contemplated embodiments of the deposition target of claim 24. Specifically, the target comprises a "cup" portion having an exterior surface and an interior surface. In Figure 16, the interior surface is represented as reference number 308. As recited in claim 24, the sputtering surface is defined along the interior surface of the cup. It should be noted in Figure 19, that the interior surfaces of the cups are those surfaces that are being sputtered.

The Kulkarni reference discloses a clad hollow cathode magnetron sputter target that is made from a plate of sputter target material and a sheet of cladding material. Kulkarni specifically explains that the benefit of the Kulkarni disclosure is that it solves the problems inherent with monolithic targets, including cost and weight (see Abstract, among other sections). The present application, including the independent claims, covers targets

that are produced from ingots and cast ingots that are ultimately formed into monolithic targets, which is exactly the opposite of Kulkarni. Therefore, it stands to reason that one would not read Kulkarni and consider this application, alone or in combination with Kardokus and/or Pavate, to produce the claims of the current application.

Pavate and/or Kardokus does not cure the obvious deficiencies of Kulkarni, alone or in combination with one another. Therefore, claim 67 is considered allowable, along with the related dependent claims, in view of Kulkarni, Pavate and/or Kardokus.

Claim 83 is rejected under 35 USC 103(a) as being unpatentable over Kulkarni (US 6283357) in view of Kardokus as applied to claims 67, 68, 70 and 71-76 above and further in view of Pavate and Lai. The Applicant respectfully disagrees.

Claim 67 recites:

"A three-dimensional physical vapor deposition target, comprising:
a material comprising one or more of Cu, Ni, Co, Ta, Al, and Ti;
an average grain size of less than or equal to 250 microns within the material;
a shape, the shape including at least one cup having a first end and a second end in opposing relation to the first end; the first end having an opening extending therein; the cup having a hollow therein; the hollow extending from the opening in the first end toward the second end; the cup having an interior surface defining a periphery of the hollow; and
a sputtering surface defined along the interior surface of the cup."

Figures 13, 15 and 16 of the current application show contemplated embodiments of the deposition target of claim 24. Specifically, the target comprises a "cup" portion having an exterior surface and an interior surface. In Figure 16, the interior surface is represented as reference number 308. As recited in claim 24, the sputtering surface is defined along the interior surface of the cup. It should be noted in Figure 19, that the interior surfaces of the cups are those surfaces that are being sputtered.

The Kulkarni reference discloses a clad hollow cathode magnetron sputter target that is made from a plate of sputter target material and a sheet of cladding material. Kulkarni specifically explains that the benefit of the Kulkarni disclosure is that it solves the problems inherent with monolithic targets, including cost and weight (see Abstract, among other sections). The present application, including the independent claims, covers targets

that are produced from ingots and cast ingots that are ultimately formed into monolithic targets, which is exactly the opposite of Kulkarni. Therefore, it stands to reason that one would not read Kulkarni and consider this application, alone or in combination with Kardokus, Lai and/or Pavate, to produce the claims of the current application.

Pavate, Lai and/or Kardokus does not cure the obvious deficiencies of Kulkarni, alone or in combination with one another. Therefore, claim 67 is considered allowable, along with the related dependent claims, in view of Kulkarni, Pavate, Lai and/or Kardokus.

Honeywell Docket No. H0002800.34350 US- 4015
Buchalter Docket No.: H9945-3905

REQUEST FOR ALLOWANCE

Claims 24-76 and 79-88 are pending in this application, and the Applicant respectfully requests that the Examiner reconsider all of the claims in light of the arguments presented and allow all current and pending claims.

Dated: December 19, 2008

By:

Respectfully submitted,
Buchalter Nemer, A Professional Corp.



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